



Regional District of Bulkley-Nechako

HRVA Electoral Area' D' Understanding Community Resiliency

April 2022

“Know the Risks, Make a Plan, Be Prepared”

PREFACE	3
Purpose of Backgrounder and Workbook	3
Summary of Selected 41 Hazards for Electoral Area 'D'	3
CHAPTER 3: UNDERSTANDING COMMUNITY RESILIENCY	4
Existing Risk Reduction Measures.....	4
Community Emergency Plans	4
Reports/studies.....	4
Critical Emergency Response Services.....	6
Community Vulnerabilities.....	7
Social Factors	8
Economic Factors.....	9
Environmental Vulnerabilities	11
Physical Infrastructure Vulnerabilities.....	12
Underlying Risk Drivers	13
Climate Change.....	13
Supply Chains.....	14
Hazard Scenarios	15
Natural Hazards	15
Flooding.....	15
Wildfire.....	16
Human-Caused Hazards.....	17
Hazard Material Spill and Motor Vehicle Incident	17
Electrical Outage	17
Diseases, Pest Infestation & Epidemics	19
Animal Disease Crisis.....	19
Plant Disease Pest Infestation.....	20
APPENDIX 1 – ELECTORAL AREA 'D' KNOWN HAZARDS MAP	21
CITED WORKS	23



Preface

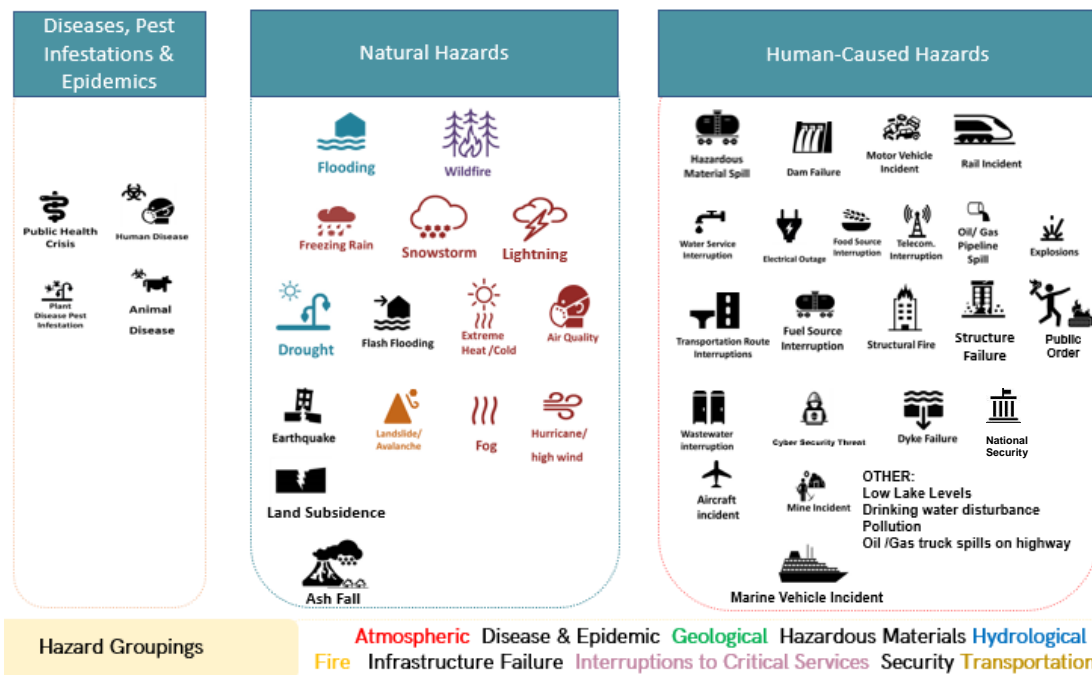
Purpose of Backgrounder and Workbook

The Regional District of Bulkley-Nechako (RDBN) is in central British Columbia with an area of 77,000 square kilometres. The RDBN is broken down into 7 Electoral Areas (EA). The focus of this document is Electoral Area 'D', Fraser Lake Rural.

The Electoral Area 'D' Understanding Community Resiliency Backgrounder will provide information and resources to committee members to inform the scope and conversations of the Hazard, Risk, and Vulnerability Analysis's (HRVA) Committee meeting. The background paper is designed to help guide committee members through the research and background materials to prepare for the upcoming likelihood and consequence scoring for each identified hazard.

An HRVA contributes to building resilience to disasters by understanding risk, risk drivers, and risk reduction strategies. There are many ways to assess risk & resilience in a community. This chapter will outline several suggested key pieces of information to help develop an understanding of community capacity, strength, exposure, and vulnerability to hazards, all of which contribute to a community's resilience in the face of disasters. The goal is to describe what is happening in Electoral Area 'D' to manage specific hazards and generate enough understanding of the community in order complete the next step in the HRVA process; scoring likelihood and consequences.

Summary of Selected 42 Hazards for Electoral Area 'D'¹



¹ 41 hazards Identified – “Other” identified hazards fits in as follows: Low Lake levels – Drought; Drinking water disturbance and pollution - Water Service Interruptions; Oil and gas truck spills on highway - Motor Vehicle incidents.

CHAPTER 3: UNDERSTANDING COMMUNITY RESILIENCY

Existing Risk Reduction Measures

The following section lists the known hazard information resources and community emergency planning documents that are available. This is a preliminary list that will be augmented through engagement with municipalities, first responders, subject matter experts, and community members. The following list is organized first by community emergency plans, followed by a listing of known hazard reports and studies in the area.

Community Emergency Plans

- Regional District of Bulkley-Nechako Emergency Preparedness Plan 2003 updated in 2011. This plan is being replaced by a Comprehensive Emergency Management Plan, with the following addendums approved by the Regional Board of Directors:
 - Livestock Evacuation Plan 2020
 - Crisis Communication Plan 2020
 - Pandemic Response 2020
 - Evacuation Route Planning (Current)
- Village of Fraser Lake Emergency Preparedness Plan 2016
- Stellat'en Emergency Plan Updated Jan 2010
- Nadleh Whut'en Emergency Plan Updated 2013

Reports/studies

Fire

- [Trail by Fire: Nadleh Whut'en and the Shovel Lake Fire, 2018](#)
- Village of Fraser Lake Community Wildfire Protection Plan 2013
- [Shovel Lake Wildfire Ecosystem Restoration Plan 2019](#)

Flooding

- [Nechako Reservoir Dam Emergency Plan \(DEP\)](#) Nov 2020
- Inundation Maps for Area D: Skins Lake Spillway ([Maps 5-9](#)) Fort Fraser ([Maps 10-11](#))
- [RDBN Floodplain Management Bylaw No. 1878, 2020](#) and [Mapping](#)

Geotechnical

- [Geotechnical Report Guidelines RDBN brochure](#)

Policies and other resources

- RDBN [Area D: Endako, Fort Fraser, Fraser Lake Rural Official Community Plan](#)
- [Fraser Lake Official Community Plan 2010](#)

Community Planning Studies

- [Fraser Lake Age-Friendly Action Plan 2019](#)

Regional Resources


- [Regional Adaptation Strategies: Bulkley-Nechako & Fraser-Fort George](#)
- [RDBN Food and Agriculture Plan 2020](#)

Oil and Gas Pipeline Spill


- PNG Pipeline has a strong emergency and safety program, including a [Transmission Pipeline Emergency Response Plan](#).
- Coastal GasLink has prepared a [comprehensive Emergency Response Plan](#)

Critical Emergency Response Services


Many critical services are located in the municipal boundaries. Below is a preliminary listing of response services and available resources within Electoral Area 'D'.




Fraser Lake RCMP
Victim Services
Fraser Lake RCMP office




Area 'D'
First Response Agencies




BC Ambulance
Station 763 Fraser Lake




Fraser Lake Fire Department
1 Full Time Staff
18 Volunteers
2 Fire Engines
Rescue Truck
SPU Trailer




Nadina Fire Zone
Burns Lake: 3 IA crews, 1 Unit crew,
5 officers




Nechako Valley Search and Rescue
30 GSAR members
3 Search managers
13 Swiftwater rescue technicians
10 ice rescue technicians
5 members based in the Fraser Lake area.




Fort Fraser Fire Hall
Fire Engine & 1 Tender Truck
11 Volunteers




Nadleh Whut'en Volunteer Fire Department
Stellat'en Volunteer Fire Department



Fraser Lake ESS
Mobilization trailer
6 volunteers



Nadleh Whut'en
EOC



RDBN
EOC

Community Vulnerabilities

To fully understand how a hazard might impact a community, it is necessary to consider the degree of vulnerability to the hazard. While being situated in a hazardous zone is a key determinant of risk, a community's vulnerability defines the susceptibility of the people, property, industry, resources, and the environment to harm should a hazard event occur.

The provinces HRVA guide defines vulnerability by the people, property, infrastructure, industry and resources, or environments that are exposed to adverse impact from a hazard event. There are four groups of vulnerabilities to consider: social, economic, physical, and environmental.

In this section we will begin to explore the four groups of vulnerabilities that may be considered in this project. This information is a starting point in the collection of known vulnerabilities within the region. The intention is that the HRVA process will help to strengthen our collective community knowledge of our vulnerabilities to enable future conversations that will focus on resilience strategies. Both vulnerability and resiliency are important, and closely related concepts for evaluating a community's ability to cope with the impacts of a hazard event. It is important to differentiate between the two:

- Vulnerability looks at the factors that increase a community's susceptibility to damage from a hazard;
- Resiliency is a measure of a community's ability to resist or recover from damage (SOPAC, 2002).

At the April 22nd, 2022, Understanding Community Resiliency Workshop participants were asked to consider and provide further details of the social, economic, environmental, and physical conditions that they perceive to have the potential to contribute to vulnerability within Electoral Area D. The discussion and input from that meeting have been integrated into this document.

Social Factors² 3



POPULATION

Seniors leaving for medical support



	2021	% CHANGE 2016 TO 2021	# < 14 YRS	seniors
Area D	1,607	9.2%	14 %	22.1 %
Fraser Lake	988	-2.3%	18.7 %	18.2 %
Fort Fraser	220	9.2%	13 %	15 %
Nautley	227	-20%	18 %	5 %
Stellaquo	189	18.2%	22 %	7.3 %

- Seaspunkut 4 population of 10

- East Francois Lake or Glenannan has an estimated year-round population of 230

LANGUAGE



In 2016, 99 % of Area D report English and both French and English as their official language.
1.4% speak another language.

LITERACY CONCERNS



Person with Disabilities

25 % potentially living with a disability = 402 in Area D

CULTURE

In 2016, 17% of Area D identified as First Nation – need for cultural learning opportunities
1% as a visible minority

HOUSEHOLD INCOME



	MEDIAN HOUSEHOLD INCOME BEFORE TAX	% OF LOW- INCOME HOUSEHOLDS
Area D	\$70, 400	14.1 %
Fraser Lake	\$75, 776	13.8 %
Fort Fraser	\$62, 976	16.7 %
Nautley	\$48, 256	
Stellaquo	\$65, 152	

HOUSING



	# OF PRIVATE DWELLINGS 2021	SINGLE DETACHED	ATTACHED HOUSING	MOVEABLE HOUSING
Area D	982	575	20	65
Fraser Lake	543	315	110	25
Fort Fraser	140	70	0	35
Nautley	106	85	15	0
Stellaquo	77	65		

² (Canada S. , 2016) the population and % change are from the [Fraser Lake 2021 Population](#) numbers and [Bulkley-Nechako D](#) population numbers , the remainder stats are from 2016.

NOTE: There is a common acceptance by RDBN residents that there was a census undercount throughout the region. It is believed that the population has not decreased to the extent surveyed and has remained relatively stable throughout the region (Nechako, 2014).

³Statistics Canada released its 2017 Canadian Survey on Disability in 2019. This report, and its dataset, offers national and provincial insights into the prevalence of disability across Canada, including the type and severity of a disability, as well as the economic circumstances for persons with one or more disabilities. Unfortunately, data representing more granular geographies like the Fort St James Rural are not available, meaning discussions must remain at the provincial level.

The 2017 survey classifies a disability as falling within one of eleven categories: pain, flexibility, mobility, mental health, seeing, hearing, dexterity, learning, memory, developmental, or unknown.

In 2017, 926,100 British Columbians aged 15 years old or older reported having at least one disability, or about 25% of all residents in that age cohort. If the same proportion applied to Smithers Rural, that would mean about 1,105 residents could be living with a disability.

Support Services



Social Housing

- Village of Fraser Lake has 16 units part of the rental assistance in Private Market program and 1 in the Rural Area D.
- Village of Fraser Lake's non-market housing contribution makes up 3% of RDBN services, all of which are rental assistance in the private market for seniors.
- As of June 2021, the BC Housing waitlist had 2 Village of Fraser Lake applicants remaining unserved.

Fraser Lake Community Service Society

Offers the community Health Centre the services of four Doctor's offices, emergency/ambulatory, diagnostic imaging, laboratory, public health, mental health, and dietitian to individuals in the community of Fraser Lake.

Autumn Services

provides support, education, activities, social interaction, food security, and events for all ages! assist people in accessing government programs, licensing, social assistance etc. Operate Better at Home program and Therapeutic Activation Program for Seniors.

Community Carrier Sekani Family Services

Services

Carrier Sekani Family Services, under the guidance of our elders, has been given the mandate to establish a comprehensive infrastructure for social, health, and legal programs, for the eventual take over of these services by the Nations themselves.



Fraser Lake Men's Shed

provides men with the opportunity to gather and support the mental and physical health of men through social engagement, encouraging creativity and fostering strong social connections.

Stellat'en First Nation Community Health Representative

Liaison with Funding agency Community Health Nurse, Health professionals, and Stellat'en First Nation Staff, to undertake activities associated to Health. To work towards a healthy community.

Nadleh Whut'en Health Program

managed by our Community Health Representative who is responsible for the delivery of health care assistance and support services to community members.

Fraser Lake Learning Centre

Nadleh Whut'en Adult Learning Centre



Community Food Programs

- Fort Fraser Food Bank
- Autumn Services Food share, Soup and Bun Program and Home Deliveries.
- Stellat'en First Nation community garden and community smoke house.

Economic Factors⁴

Economic resilience drives a community's recovery post-disaster (FEMA, 2013). Therefore, economic vulnerability is a key determinant of a community's ability to withstand and rebound from a hazard event. Single industry communities may be more susceptible to harm than those with diverse economic sectors (Bergstrand, 2015). It is important to better understand and consider economic vulnerabilities when developing plans and strategies build disaster resiliency.



Economy

	PARTICIPATION RATES	EMPLOYMENT RATES	UNEMPLOYMENT RATES
Area D	58.9 %	52.6 %	10.1 %
Fraser Lake	63.5 %	52.2 %	17.8 %
Fort Fraser	65.2 %	58.7 %	10 %
Nautley	67.7 %	48.4 %	28.6 %
Stellaquo	48.4 %	35.5 %	20 %

Agriculture



Fraser Lake Community Market



- Fraser Lake Sawmill
- Many small operators



Volunteers are a critical economic component of the region and provide critical services in Rural areas

Other Contributing Industries & Employers



⁴ (BC Ministry of Agriculture, 2013). (Strategies, 2020)

Environmental Vulnerabilities⁵

Environmental vulnerability measures how damage to the natural environment impacts a community's ability to withstand and recover from a hazard event. The natural environment can provide a protective buffering service that reduces the magnitude of impacts of hazard events. For example, wetland and riparian areas reduce flooding by absorbing flood waters, providing erosion and sedimentation control, and recharging groundwater.



Ecosystem Environment

Forests of the area are mostly lodgepole pine and spruce, with scattered patches of aspen and birch. A history of frequent wildfires has left a natural mosaic of forest ages. Old forests (greater than 250 years) are relatively uncommon in this area, except for the scattered groves of old-growth Douglas-fir, and the few higher elevation mature Engelmann spruce and sub-alpine fir forests. (Vanderhoof LRMP 1997)

Predominant Natural Features



3
Hydrometric
Station

Fraser Lake, East end of Francois Lake,
Knewstubb Lake, Cheslatta Lake
Francois South
Nechako Canyon
Endako, Stelako, Nechako, and
Necoslie Rivers

Water supply for
wildfires and food
are at risk

Parks



- 4 BC Parks/ Ecological Reserves
- 18 Recreation Sites and Trails

Flood Zones

Nechako Reservoir and Nechako River
Fraser Lake - local atmospheric river
events

Kokanee Fish Habitats

Fraser, Francois and Tchesinkut
Nadleh Fisheries program

Wildfire Impacts

2018 Wildfire impacts Shovel Lake Wildfire
Complex burnt an estimated 93,000
hectares

Air Quality



- Health Risks during
forest fire
- No air quality
monitoring stations

Fraser Lake Important Bird Area

- globally significant wintering site for Trumpeter Swans
- a continentally important site for fall migrating waterfowl
- a nationally significant site for fall migrating American Wigeon
- one of the key sites for moulting ducks in BC.

(Barry P. Booth, 2001) (Zirnhelt, Miller, & McGregor, 1997)

⁵ Parks BC: Beaumont, Francois Lake, Nechako Canyon Protected Area, Stelako River Wildlife Management Area.
Rec sites: Angly Lake, Anzus Lake, Borel Lake, Brewster Lake, Burner Bay, Casey Lake, Etcho Lake, Hallett Lake,
Hobson Lake, Knewstubb Lake, Laurie Lake, Meuoon Lake, Oona Lake, Ormond Lake, Peterson's Beach, Rum
Cache Lake, Stern Lake, Top Lk. & Peta Lk.

Physical Infrastructure Vulnerabilities

Physical vulnerability is a measure of how damage to a community's buildings, facilities, and infrastructure, e.g., transportation, electricity, telecommunication, water supply etc., can impact a community's ability to withstand and recover from a hazard event. Public Safety Canada defines critical infrastructure (CI) as: "services essential to the health, safety, security or economic well-being of Canadians and the effective functioning of government" (Canada P. S., 2021). The following ten sectors are considered critical infrastructure in Canada: Health; Food; Finance; Water; Information and

Communication

Technology; Safety;

Energy and Utilities;

Manufacturing;

Government; and

Transportation.

Forecasting the

failure of these

complex sector is

challenging as

weaknesses in the

system may be

unknown until the

infrastructure fails.

Also, the

responsibility for

various critical assets

and infrastructure is

divided between

different levels of

government and

public and private

agencies, further

adding to the

difficulty of preparing

for and mitigating

against critical

infrastructure

disruption and

damage.^{6 7 8 9}

Physical Critical Infrastructure

Communication

- Cellular: Rogers, Telus, Virgin, Public, Bell
- Internet: Telus group of companies (Telus, Mascon and ABC) are the only non-satellite, Xplornet, Galaxy, StarLink
- Phraser Connector
- 5 radio stations and 4 public broadcasting TV stations (Fraser Lake Television Rebroadcasting)
- Forestry Radio Network
- Bulkley Nechako Emergency & Public Alert System: Voyent Alert



Health Services

- Fraser Lake Community Health Centre
- Health LinkBC – 8-1-1
- Nadleh Health Centre
- Carrier Sekani Family Services



Utilities

- BC Hydro Power along Hwy 27 – substations in FSJ
- Pacific Northern Gas along Hwy 27
- Street Lighting – Fort Fraser and Endako



Community Water and



Sewer



- Fort Fraser Water System
- Fort Fraser Sewer System
- Stellat'en water/ Sewer distribution systems
- Nautley No. 1 Community Water Supply & Distribution at a Low Risk
- Nautley NO. 1 (S. & N. Fort Fraser) – Community Sewage Collection & Treatment
- SEASPUNKUT NO. 4 – Community Water Supply & Distribution System and sewage collection at a low risk



Transfer Station

- Fraser Lake Transfer Station

School

SD 91:

- Mouse Mountain Elementary (K-3)
- Fraser Lake Elementary-Secondary (4 – 12)

Other:

- College of New Caledonia
- Nadleh Koh Pre-School
- Nadleh Whut'en Adult Learning



Transportation

- MOTI Roads, Highway 16, & Forestry Roads
- Fraser Lake Community Transportation
- Northern Health Bus
- BC Bus Northern PG-PR
- CN Rail
- Fraser Lake Airport
- Fraser Lake Seaplane Base

Community Halls



- Fort Fraser Community Hall
- Stellaquo Community Hall
- Nadleh Whut'enne Yah
- Endako Community Hall

⁶ There are 20 community water systems in Electoral Area 'D'(Endako, Fraser Lake & Fort Fraser) that service anywhere from 2 – 10000(potential) connections. Information on water facilities can be found on [Northern Health Drinking Water reports and summaries under](#) Endako, Fraser Lake & Fort Fraser).

⁷ Internet: There are 7 internet service providers in the region (Corporation, 2019), and a seventh, Starlink scheduled for 2021.

⁸ Radio: There are 5 radio channels: VF2473 92.1 FM, VF2474 93.1 FM, VF2475 94.1 FM, VF2476 95.1 FM, CIFL 1450 AM; and 5 television stations broadcasting through the Fraser Lake Rebroadcasting).

⁹ [First Nations Community Water System Water Risk Summary](#) Nadleh Whut'en and Stellaquo.

Underlying Risk Drivers

There are additional factors which increase a community's susceptibility to hazards. As a committee it may be helpful to discuss possible "underlying disaster risk drivers" to help differentiate them from hazards and risks and help identify additional vulnerabilities. According to the United Nations Office of Disaster Risk Reduction (UNISDR), underlying disaster risk drivers, or factors, may include:

- Poverty, inequality, and literacy
- Climate change and variability
- Unplanned and rapid urbanization
- Unsustainable uses of natural resources
- Declining ecosystems
- Lack of disaster risk considerations in land management and environmental and natural resource management
- Demographic change
- Lack of regulations and incentives for private disaster risk reduction investment
- Non disaster risk-informed policies
- Complex supply chains
- The limited availability of technology

Which of these factors should be considered in Electoral Area 'D'? What considerations need to be considered? And are these considerations localized to specific geographic areas?

Climate Change

Climate change is not an abstract future concern, but rather a current, evolving reality experienced in Canada today. Canada's climate has been increasing in temperature and is predicted to continue to increase in the coming years. According to the recent Canada's Changing Climate Report, Canada's climate is warming at a rate nearly twice the global average (Bush, 2019). Projections suggest that by the years 2081 to 2100, Canada's climate will increase by 1.8°C if emissions are reduced, or up to 6.3°C if emissions remain high (Bush, 2019).

The Preliminary Strategic Climate Risk Assessment for British Columbia states that, by the year 2050, the greatest risks to all British Columbia as a result of climate change will be severe wildfire seasons and seasonal water shortages (BC Ministry of Environment and Climate Change Strategy, 2019). Climate change is likely to affect most hazards faced in the region. According to the BC Ministry of Environment and Climate Change, "the likelihood of most risk events increases over time based on projections of future climate change" (Strategy, 2019).

Omineca Natural Resource Region Climate Projections (Foord, 2016)


Mean annual temperature in the Omineca Natural Resource Region is projected to increase by 3.5°C with minimum temperatures increasing more than maximum temperatures. Mean annual precipitation is projected to increase by 7%. Any increases will likely be as rainfall because precipitation as snow is projected to decrease by about 30% (ranging from -10% in Mackenzie District to -40% in the Robson Valley). The number of growing degree-days will increase, and the number of frost-free days will increase. Evaporation and climate moisture deficit will increase despite moderate increases in growing-season precipitation.

According to the [Climate Atlas of Canada](#), a web resource that combines climate science, mapping, and storytelling to bring the global issue of climate change closer to home for Canadians, Houston climate predications are as seen in the chart below:



Climate Data

The Bulkley Nechako region's complex topography creates considerable climate variability over short distances. Baseline temperatures vary with elevation (warmer in the valleys and cooler in the mountains).

	NADLEH WHUTEN			STELLAT'EN		
	1976-2005	2021-2050	2051-2080	1976-2005	2021-2050	2051-2080
MEAN ANNUAL  °C	2.3 °C	4.2 °C	6.2 °C	2.7 °C	4.7 °C	6.6 °C
PRECIPITATION						
Winter	135 mm	145 mm	157 mm	133 mm	143 mm	155 mm
Spring	86 mm	91 mm	99 mm	83 mm	88 mm	96 mm
Summer	154 mm	160 mm	160 mm	151 mm	157 mm	157 mm
Fall	137 mm	148 mm	163 mm	137 mm	148 mm	163 mm
FROST FREE DAYS ANNUAL	91	127	157	98	133	162

*Climate Data for Nadleh Whuten and Stellat'en First Nations GHG emissions continue to increase at current rates ([ClimateAtlas 2019](#))

Supply Chains

Disasters disrupt pre-existing networks of supply. In many communities our reliance on just-in-time inventory practices, combined with the heavy use of technology to fulfill orders can result in supply gaps and significant delays in restoring services. This can cause panic among residents, failure to meet the health and medical needs of the population, and if unmanaged, turn an emergency into a disaster.

The food supply in the region can be threatened in an event of a disaster outside the region. The main grocery stores across the region are supplied 50% from the lower mainland and the remainder coming from Edmonton/Alberta. In response to the 2021 November floods in the lower mainland the large chain stores were quick to develop business continuity plans to reroute trucking through the US, into Alberta and back over to the North.

Fuel supply in the region can also be threatened in an event of a disaster outside the region. Most of the fuel is transported from Alberta via Trans Mountain Pipeline and railway. Prince George is the [distribution centre](#), where fuel is then trucked to its destination. There is a refinery in Prince George that refines gasoline, diesel, propane butane and heavy oil.

Hazard Scenarios

For each identified hazard, complete the hazard scenario worksheet. These scenario worksheets are designed to help guide the committee throughout the HRVA process and will be provided to committee members as a tool during the likelihood and consequence scoring step of the HRVA.

Please work with fellow workshop participants to complete the hazard Scenario worksheets by writing notes under each hazard scenario. Please reference the revised Hazard Identification backgrounder for information and historical information on each hazard selected.

In the hazard identification workshop participants started discussing primary hazards and the concept of cascading hazards that may arise due to a hazard occurring in an area. For example, flooding may cause transportation interruptions, electrical outages, etc. Please refer to both the Hazard ID backgrounder and the Summary of the Hazard ID workshop to help inform your contributions to the completion of these worksheets.

Natural Hazards



Flooding (not discussed)

Scenario Description:

Snow packed mountains and spring thaws have brought rivers, creeks, lakes to record flood levels. Environment Canada has forecast several days of heavy rainfall combined with warmer temperatures, which will hasten snow melt and cause a further rise in river levels. The first day of incessant rain guarantees some flooding in known flood areas of Francios Lake, Fraser Lake, Fort Fraser, Stellaquo and Nadleh communities. Some residents are concerned about the safety of their homes and water supply.

By the end of the second day of rains, communities are experiencing severe flooding. The Nechako River is still likely two days from cresting. The river level is now increasing quickly, and some small creeks have almost become rivers themselves.

On day three, residents in the community begin reporting flooded basements, and there is a run-on pump at all local hardware stores. Citizens in your community are asking for guidance on what they should do.

Environment Canada projects another 3 days of heavy rain and continued warm temperatures at higher elevations. If needed, please add more detail to the scenario as we go along.



Wildfire

Scenario Description:

In May multiple forest fire starts South of Endako from lightening strikes. Winds are high, the spring drought conditions create a dry forest fuel that results in the fire growing rapidly and uncontrolled. The winds are pushing the fires South towards Francois Lake and east towards Fraser Lake threatening the residents and making travel in the region challenging. Evacuation alerts have been issued to rural residents along Francois Lake. [Fire behavior is a rank 5-6](#). If needed, please add more detail to the scenario as we go along.

List Secondary or cascading hazards that may result:

- Air quality
- Loss of wildlife habitat – relocation of species ie forest fire brought wolves to town.
- Displaced people
- Critical infrastructure losses and more!

Triggering Event (Root causes of this type of event):

- Climate Change
- Forest practices root cause creating mono culture crops and forests.

Impact Summary

- **What social, economic, environmental, and physical factors may increase the community's susceptibility to damage because of this hazard?**
 - need for alternative power source from the BC Hydro grid.
 - Economic impacts of forest fire – restoration to maintain economy in the region
 - Creates environmental vulnerabilities affecting salmon habitat, human roads. And more.
 - 'we' fight fire because of houses – mis practice, manage for ecosystem diversity.
 - Fuel management creates a vulnerability
 - Prescribed burns are limited to protect communities and rail lines.
 - Resources for rebuild – CN loses tracks in Lilloet – tracks are re-built in a week, where as houses on reserve may never get rebuilt?
 - Vulnerability of rural communities is that they are controlled by the economic interest.
 - Need for indigenous knowledge to be integrated into culture ie. Balsam tea good for covid recovery.
 - Shovel Lake Wildfire Ecosystem Restoration Plan – Many great examples of vulnerabilities and plans for restoration and adaptation.

Likelihood Rating <i>(Please Circle)</i>	Consequence Severity <i>(Please Circle)</i>
E – Almost Certain to Occur	4 – Extreme Impact
D – Likely to Occur	3 – High Impact
C – Probable to Occur	2 – Moderate Impact
B – Unlikely to Occur	1 – Low Impact
A – Very Rare to Occur	0 – No Impact

Human-Caused Hazards

Hazard Material Spill and Motor Vehicle Incident



Scenario Description:

It is summer and there was a reported head on collision with an industrial truck carrying hazardous mine chemicals and a 10-passenger van.

There are several serious life-threatening life injuries. The truck has caused significant damage to the bridge crossing the Stellako River making it unpassable, and the truck has spilt its contents into the river and on the bridge deck and caught fire requiring fire response.

If needed, please add more detail to the scenario as we go along.

List Secondary or cascading hazards that may result:

- Difficulty getting emergency services through for accidents or those at home;
- Fisheries – water – waterway - quality
- Damage to bridge
- Risk to first responders

Triggering Event (Root causes of this type of event):

- Road conditions, weather, speed, texting/sun in eyes
- In experienced drivers, being tired, fires
- Poor mechanical conditions / gases from chemical s of vehicles

Impact Summary

- What social, economic, environmental, and physical factors may increase the community's susceptibility to damage this hazard?
- Are there specific neighbourhoods in Area 'D' that have particular vulnerabilities? What conditions exist that have the potential to contribute to vulnerability within this neighbourhood?
- Focus the conversation on the impacts as the event is happening (recovery will be a focus of conversation at future meetings).
 - Long stretches of road without rest stops
 - Infrastructure not enough double lanes
 - Increase in insurance cost
 - Highway closures and rerouting
 - Blind corner by bridge
 - Recovery hazmat
 - Water shutdown

Likelihood Rating <i>(Please Circle)</i>	Consequence Severity <i>(Please Circle)</i>
E – Almost Certain to Occur D – Likely to Occur C – Possible to Occur B – Unlikely to Occur A – Very Rare to Occur	4 – Extreme Impact 3 – High Impact 2 – Moderate Impact 1 – Low Impact 0 – No Impact



Electrical Outage

Electrical Outage

Scenario Description:

On October 28, a massive snowstorm that hit northern British Columbia dumped 2.5-3 ft. (75-90 cm) of wet heavy snow in over night. It resulted in a combination of two weather systems, a warm Pacific and a large cold front, colliding. Roads and Highways in the region have been temporarily closed, including Highway 16. Road contractors are working to reopen the roads, but this will take many days, particularly for the rural Fraser Lake residents and Glennan residents.

The early season snowstorm left BC Hydro customers in the region without power, and many trees have knocked down local power lines. Six days after the storm, still many households remained without power and most of these were unlikely to get service back for several more days. Temperatures of -15 were set in the forecast.

List Secondary or cascading hazards that may result:

Supply Chain issues, extreme weather (cold), fuel source interruption, health issues/public health crisis, communications interruptions, water supply

Triggering Event (Root causes of this type of event):

Severe snowstorm, windstorm, forest fire

Impact Summary

- **What social, economic, environmental, and physical factors may increase the community's susceptibility to damage this hazard?**
Homes without heat or backup sources. Food supply (freezers thawing) medical devices shutting off (people who have devices at home and no backup).
- **Are there specific neighbourhoods in Area 'D' that have particular vulnerabilities? What conditions exist that have the potential to contribute to vulnerability within this neighbourhood?**
Glenannan egress is limited, senior housing (silver birch)
Limited community centres that could be used for warming centres during winter power outages.
Birch Bay resort sewage and water systems need power, if non present it could become contaminated.

Likelihood Rating <i>(Please Circle)</i>	Consequence Severity <i>(Please Circle)</i>
E – Almost Certain to Occur	4 – Extreme Impact
D – Likely to Occur	3 – High Impact
C – Probable to Occur	2 – Moderate Impact
B – Unlikely to Occur	1 – Low Impact
A – Very Rare to Occur	0 – No Impact

Diseases, Pest Infestation & Epidemics



Animal Disease

Animal Disease Crisis

Scenario Description:

*It is summer and there are reports of farms in Area D losing mass amounts of cattle in a short period of time. Testing of the carcasses exposes that there is a large Bovine Spongiform Encephalopathy (BSE) outbreak in Area D. Fear surrounding the potential health risks of BSE to humans, such as Creutzfeldt-Jakob disease, drives panic in the region and in supply chains. **Bovine spongiform encephalopathy (BSE)**, commonly known as **mad cow disease**, is an incurable and invariably fatal [neurodegenerative disease](#) of [cattle](#). The [time between infection and onset of symptoms](#) is generally four to five years.^[2] Time from onset of symptoms to death is generally weeks to months.*

List Secondary or cascading hazards that may result:

- Human contamination
- Soil contamination
- Economic impacts

Triggering Event (Root causes of this type of event):

- Contaminated food sources (contaminated feed)
- Infections can occur naturally (Brazil experienced this without contaminated feed)

Impact Summary

- **What social, economic, environmental, and physical factors may increase the community's susceptibility to damage from this hazard?**
- **Are there specific neighbourhoods in Area 'D' that have particular vulnerabilities? What conditions exist that have the potential to contribute to vulnerability within this neighbourhood?**
- Supply chain disruptions
- The entire region and province will be vulnerable
- Transmission concerns
- Regional complacency to animal disease.
- Provincial vets, however the access and availability is low.
- No vet in FL
- Government of Canada has incentives and grants for people to become vets, however this is only a funding commitment for one year currently. Need more advocacy on this front.

Likelihood Rating <i>(Please Circle)</i>	Consequence Severity <i>(Please Circle)</i>
E – Almost Certain to Occur D – Likely to Occur C – Probable to Occur? B – Unlikely to Occur A – Very Rare to Occur	4 – Extreme Impact 3 – High Impact 2 – Moderate Impact 1 – Low Impact 0 – No Impact



Plant Disease Pest Infestation

Scenario Description:

After several relatively warm winters, a massive outbreak of spruce beetle and fir beetle results in the loss of millions of hectares of spruce and fir forests in the Prince George (Fraser Lake) TSA over the next 15 years. We are going to look at the impacts of this infestation on the forest sector and communities in the Fraser Lake Rural Area D. If needed, please add more detail to the scenario as we go along.

List Secondary or cascading hazards that may result:

- Economy, fires, landslides, flooding, tourism down, loss of jobs, residents needing to move;
- Loss of animal and plant species
- Loss of recreational areas
- Loss of substance

Triggering Event (Root causes of this type of event):

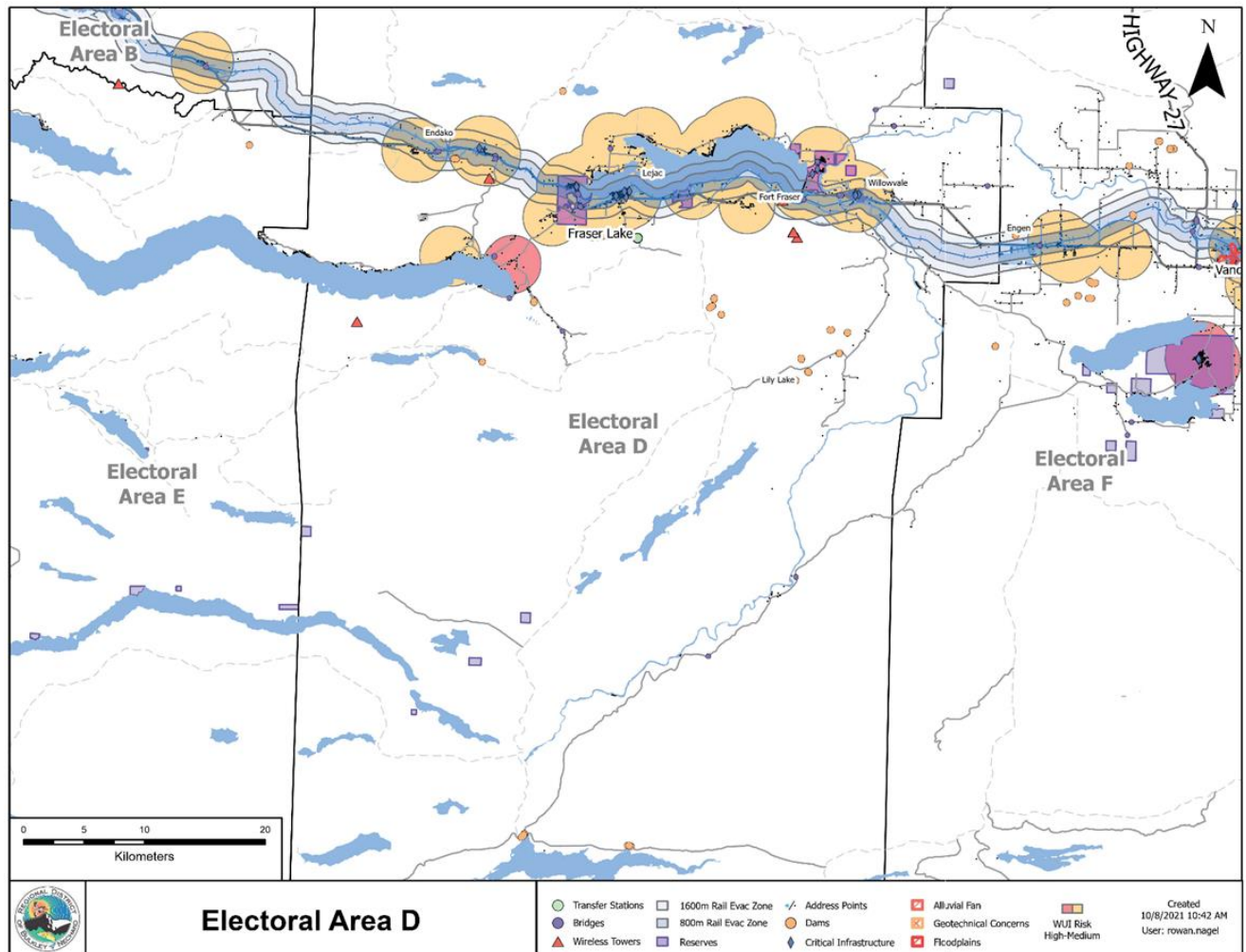
- Heat down, climate change
- Warmer winters
- Transport of invasive species
- Lack of initial response/lack of diversity in trees

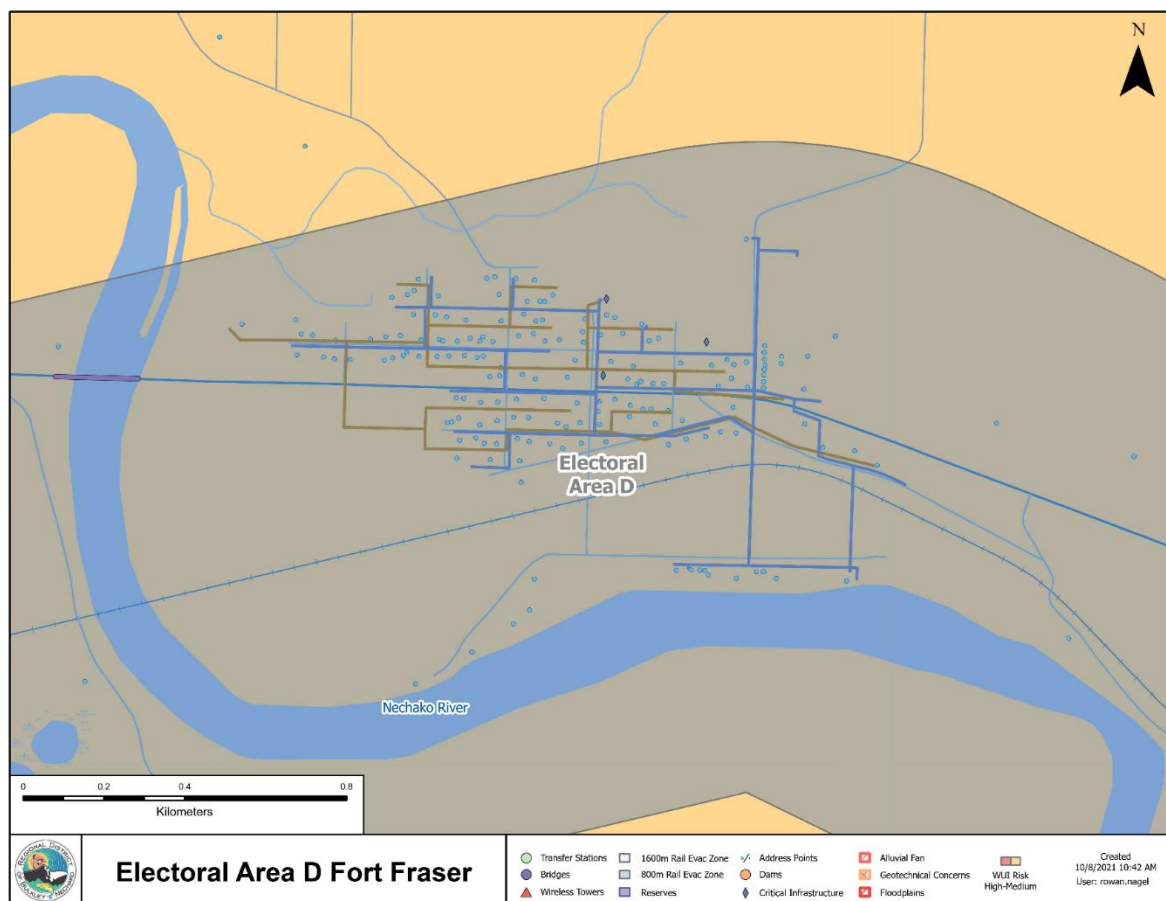
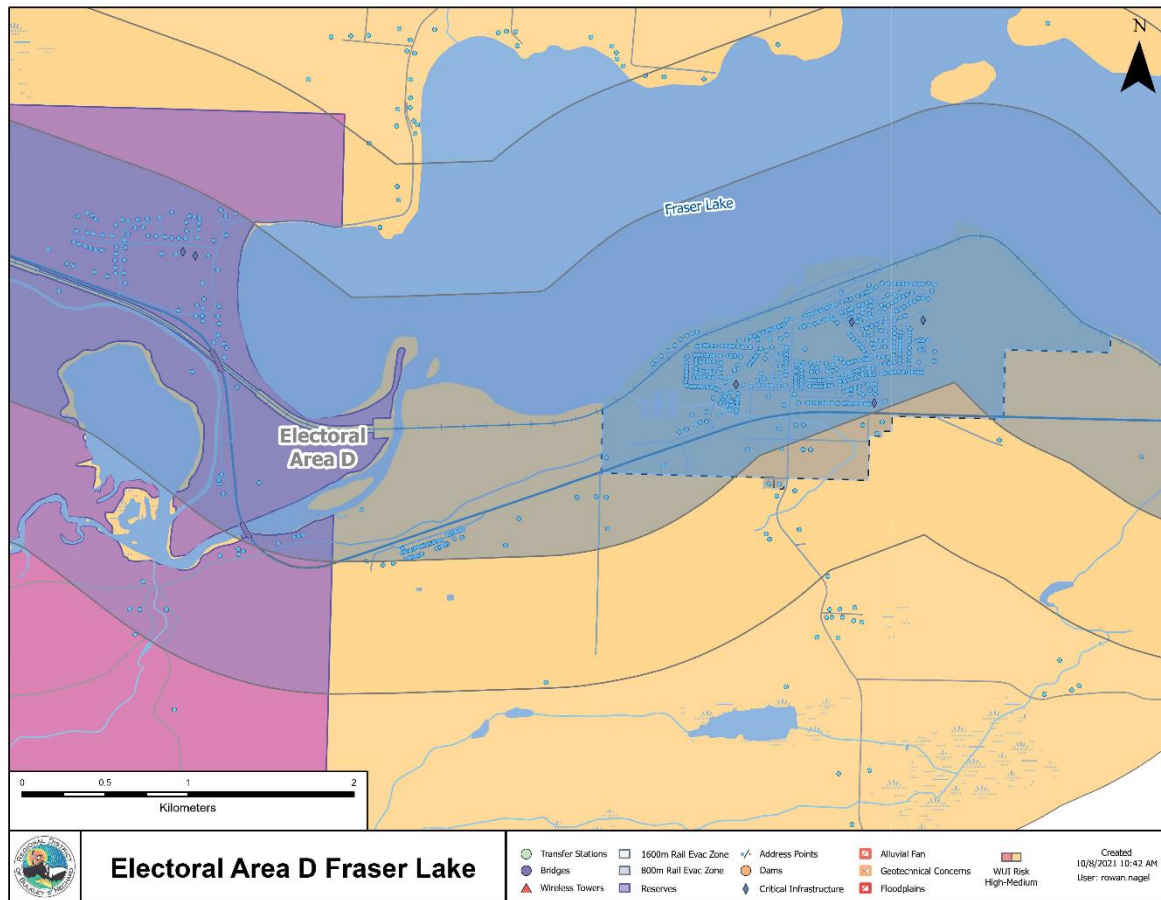
Impact Summary

- **What social, economic, environmental, and physical factors may increase the community's susceptibility to damage this hazard?**
- **Are there specific neighbourhoods in Area 'D' that have particular vulnerabilities? What conditions exist that have the potential to contribute to vulnerability within this neighbourhood?**
- The last fire
- Tourism – need proper signage and education entering. Trail heads make sure boots etc. clean of bugs.

Likelihood Rating <i>(Please Circle)</i>	Consequence Severity <i>(Please Circle)</i>
E – Almost Certain to Occur D – Likely to Occur C – Probable to Occur B – Unlikely to Occur A – Very Rare to Occur	4 – Extreme Impact 3 – High Impact 2 – Moderate Impact 1 – Low Impact 0 – No Impact

Appendix 1 – ELECTORAL AREA 'D' KNOWN HAZARDS MAP





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